Dr. Killian next introduced Dr. York, who, he indicated, would discuss various illustrative space science programs designed to achieve the objectives of space science which had just been outlined by Dr. Purcell.

Dr. York spoke first, using a chart, of the vehicles which would be used in the exploration of outer space. The first usable vehicles would be the IRBMs--JUPITER and THOR--with added stages. Such vehicles would be available late in 1958 or early in 1959. They would eventually be able to carry a pay-load (instrumentation, etc.) weighing 500 pounds.

Later on in the process, Dr. York indicated that ICBM vehicles would become available for space exploration. Either TITAN or ATLAS could be used, perhaps in 1961, with a third stage added to them. The pay-load carried by these vehicles would be much larger than that which the IRBMs could carry. The pay-load for an earth satellite could be as large as 6500 pounds if fluorine were used for fueling, or 3800 pounds if the ICBM were fueled with liquid oxygen (lox). For a moon-hit or a Mars-hit, a pay-load of 2150 pounds with fluorine and 1000 pounds with lox could be carried.

Dr. York cautioned that even an ICBM vehicle was not sufficiently powerful to get a man to the moon. To do this we would have to construct a very large new rocket with a weight of 1.5 million pounds gross. He estimated the cost of developing such a new rocket as lying somewhere between $500 million and $1 billion.

After describing the various sample or illustrative space science and exploration programs, Dr. York turned to the subject of the approximate costs of such programs. The cost of any effective space exploration program would begin at $275 million a year, and would be likely to reach a cost of $650 million a year by 1965. Such figures, moreover, said Dr. York, were minimal.

Dr. York pointed out that a probing of the planet Mars, which might be achieved by the United States in 1962, would probably be the first achievement we could count on doing before the Russians, because they were so far ahead of us in big boosters.

The final section of Dr. York's report dealt with the possible effects to be achieved by exploiting very large megaton bombs at various heights above the earth's atmosphere. If sufficiently powerful, such explorations, he believed, could inhibit all space travel, including intercontinental ballistic missiles.

In bringing the report to a close, Dr. Killian, followed by Secretary Quarles, stressed the security aspects of the information which had been provided for the Council, most particularly with respect to the final portion of Dr. York's presentation. Dr. Killian